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## BACKGROUND INFORMATION

| | |
|---|---|
| Application No.: | 13-3093A |
| Plant ID No.: | 103-00069 |
| Applicant: | SWN Production Company, LLC |
| Facility Name: | Robert Baxter Pad |
| Location: | County Route 4 St. Josephs Road near Proctor, WV |
| NAICS Code: | 211111 |
| Application Type: | NSR Class I Administrative Update |
| Received Date: | October 5, 2016 |
| Engineer Assigned: | Jonathan Carney |
| Fee Amount: | $0.00 |
| Date Fee Received: | N/A |
| Complete Date: | October 28, 2016 |
| Due Date: | December 27, 2016 |
| Applicant Ad Date: | N/A |
| Newspaper: | N/A |
| UTM's: | Easting: 523.34389 Northing: 4396.00194 Zone: 17T |
| Description: | Permit R13-3093A will supersede and replace R13-3093. It is proposed in this application to remove one (1) Caterpillar G3306NA 145-bhp compressor engine, one (1) Caterpillar G3406NA 215-hp compressor engine, reduce the condensate throughput estimate from 1,900 bbl/d to 80 bbl/d, revise the condensate flash emission factor from 2.97 lb/bbl to 28 lb/bbl and the produced water flash emission factor from 0.02 lb/bbl to 0.01 lb/bbl based on an updated simulation report, tank vapor capture efficiency has been revised from 98% to 100%, replace a 30-mmBtu/hr vapor combustor with a 15-mmBtu/hr vapor combustor, revise truck loading, fugitive, haul road emissions based on change in condensate throughputs and revised change to global warming emissions using Global Warming Potential multipliers and other recent revisions of 40 CFR Part 98 – Greenhouse Gas Reporting rule. |

## DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3093A:

The facility is an oil and natural gas exploration and production facility, responsible for the production of condensate and natural gas. Storage of condensate and produced water will also occur on site. A description of the facility process is as follows: Condensate, gas, and water come from the eight (8) wellhead(s) to the line heaters then to the production units, where the first stage of separation occurs. Fluids (condensate and produced water) are sent to the heater treaters. Flash gases from the heater treaters are routed to the storage tanks. Produced water from the heater treaters flow into the produced water storage tanks. Condensate flow into the low-pressure towers. Flash gases from the low-pressure towers are routed to the storage tanks.

Condensate flows to the condensate storage tank(s). The natural gas stream exits the facility for transmission via pipeline. Condensate and produced water are transported offsite via truck.

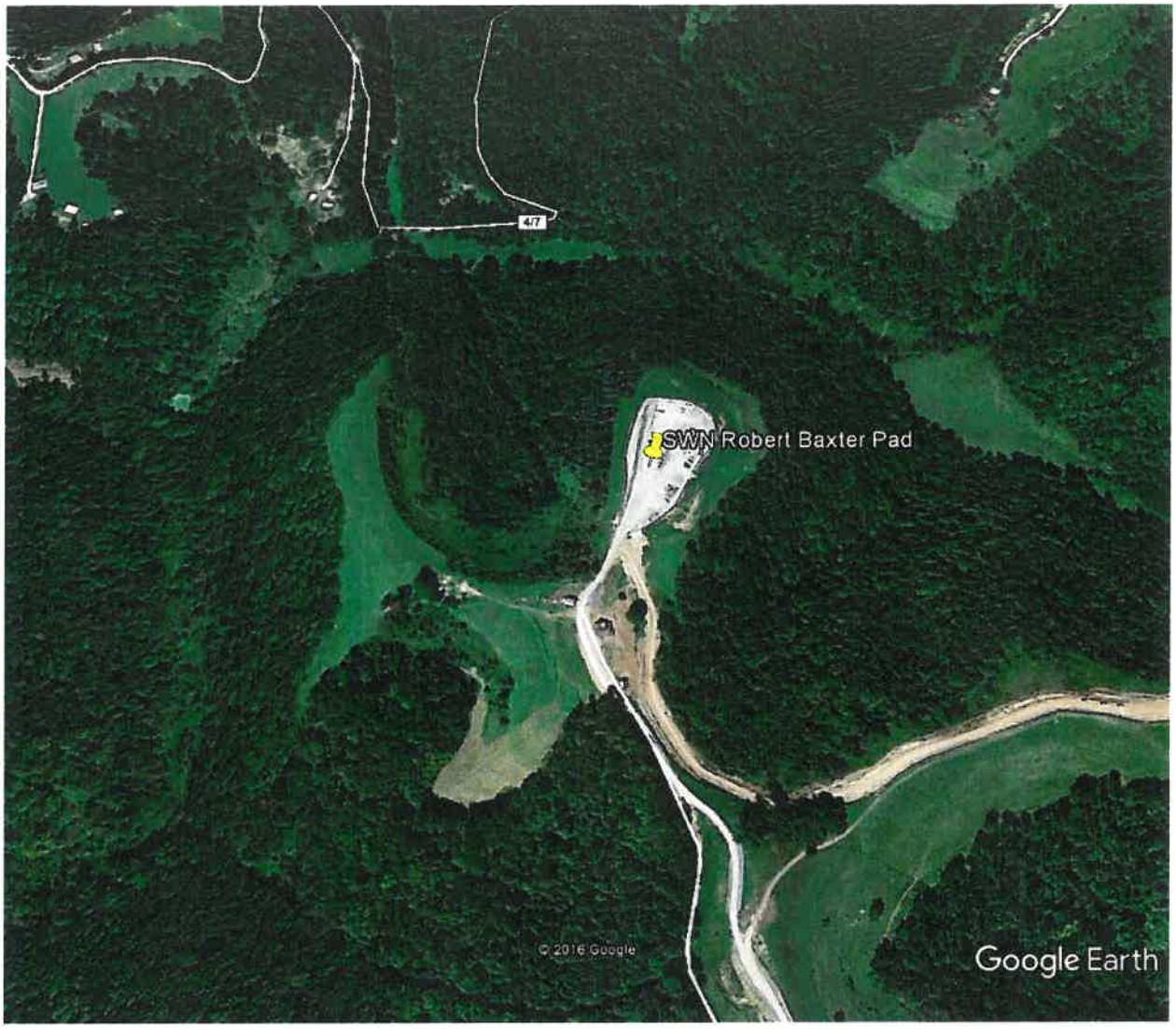
Loading emissions are controlled with vapor return, which has at least 70% capture efficiency, routed to the vapor combustor for at least 98% destruction efficiency. Working, breathing and flashing vapors from the condensate and produced water storage tanks and flash gases from the heater treaters and low pressure towers are routed to the remaining vapor combustor with a 100% capture efficiency to be burned with at least 98% destruction efficiency. The vapor combustor has one (1) natural gas-fired pilot to ensure a constant flame for combustion.

## SITE INSPECTION

A site inspection was performed by DEP DAQ's Compliance and Enforcement NPRO Angela Carey on January 1, 2016. Ms. Carey determined that the facility was in compliance.

Directions to the proposed facility are as follows:

*From Proctor: Turn right onto County Road 89/Proctor Creek Road and proceed 6.2 miles. Take a slight left on County Road 4/St. Joseph Baker Hill Road and go 0.6 miles. The site is on the left.*




ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emission changes associated with this administrative amendment application consists of removal of combustion emissions from the compressor engines (EU-ENG1 and EU-ENG2) and reduction in emissions from the ten (10) condensate tanks (EU-TANKS-COND), six (6) produced water tanks (EU-TANKS-PW), condensate truck loading (EU-LOAD-COND), produced water truck loading (EU-LOAD-PW), vapor combustor (APC-COMB-LPT & APC-COMB-TKLD), fugitive emissions (EU-FUG), and fugitive haul road emissions. The following table indicates which methodology was used in the emissions determination:

| Emission Unit ID# | Process Equipment | Calculation Methodology | Change |
|---|---|---|---|
| EU-ENG1 | 145 hp Caterpillar G3306 NA Compressor Engine w/ NSCR | Manufacturer's Data | Removal |
| EU-ENG2 | 215 hp Caterpillar G3406 Compressor Engine w/ NSCR | Manufacturer's Data | Removal |
| EU-TANKS-COND | Ten (10) 400 bbl Condensate Tanks | EPA Tanks 4.09 Emission Estimation Software, Promax Process Simulation | Modification (Throughput decrease) |
| EU-TANKS-PW | Six (6) 400 bbl Produced Water Tanks | EPA Tanks 4.09 Emission Estimation Software, Promax Process Simulation | Modification (Throughput decrease) |
| EU-LOAD-COND | Condensate Truck Loading | EPA AP-42 Emission Factors | Modification (Throughput decrease) |
| EU-LOAD-PW | Produced Water Truck Loading | EPA AP-42 Emission Factors | Modification (Throughput decrease) |
| APC-COMB-LPT & APC-COMB-TKLD | One (1) 15.0 MMBTU/hr | EPA AP-42 Emission Factors | Modification (Design capacity reduced; Throughput decrease) |

Fugitive emissions for the facility are based on calculation methodologies presented in the 2009 American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry. The factors presented in the API Compendium are for methane emissions. Therefore, the fugitive VOC and HAP emissions were calculated using a representative gas analysis and the weight percent of each respective pollutant.

Maximum controlled point source emissions from the revised changes were calculated by SWN Production and checked for accuracy by the writer and are summarized in the table below.

| Emission Point ID | Emission Unit ID | Process Unit | Pollutant | Maximum Controlled Emission Rate | |
|---|---|---|---|---|---|
| | | | | Hourly (lb/hr) | Annual (ton/year) |
| EP-ENG1 | EU-ENG1 | 145 HP Caterpillar G3306 NA Compressor Engine | Nitrogen Oxides | 0 | 0 |
| | | | Carbon Monoxide | 0 | 0 |
| | | | Sulfur Dioxide | 0 | 0 |
| | | | Particulate Matter-10 | 0 | 0 |
| | | | Volatile Organic Compounds | 0 | 0 |
| | | | Formaldehyde | 0 | 0 |
| | | | Total HAPs | 0 | 0 |
| | | | Carbon Dioxide Equivalent | 0 | 0 |
| EP-ENG2 | EU-ENG2 | 215 HP Caterpillar G3406 NA Compressor Engine | Nitrogen Oxides | 0 | 0 |
| | | | Carbon Monoxide | 0 | 0 |
| | | | Sulfur Dioxide | 0 | 0 |
| | | | Particulate Matter-10 | 0 | 0 |
| | | | Volatile Organic Compounds | 0 | 0 |
| | | | Formaldehyde | 0 | 0 |
| | | | Total HAPs | 0 | 0 |
| | | | Carbon Dioxide Equivalent | 0 | 0 |
| EP-TANKS-COND | EU-TANKS-COND | 10 – 400 bbl Condensate Tanks | Volatile Organic Compounds | * | * |
| | | | Total HAPs | * | * |
| EP-TANKS-PW | EU-TANKS-PW | 6 -400 bbl Produced Water Tanks | Volatile Organic Compounds | * | * |
| | | | Total HAPs | * | * |
| EU-LOAD-COND | EP-LOAD-COND | Condensate Truck Loading | Volatile Organic Compounds | 0.22 | 0.95 |
| | | | Total HAPs | 0.02 | 0.08 |
| | | | Carbon Dioxide Equivalent | 0.22 | 0.95 |
| EU-LOAD-PW | EP-LOAD-PW | Produced Water Truck Loading | Volatile Organic Compounds | 0.01 | 0.03 |
| | | | Total HAPs | <0.01 | <0.01 |
| | | | Carbon Dioxide Equivalent | 0.54 | 2.37 |

*These used to have values assigned to them but these values have been removed because the applicant has changed the capture efficiency from 98% to 100%.

| Emission Point ID | Emission Unit ID | Process Unit | Pollutant | Maximum Controlled Emission Rate | |
|---|---|---|---|---|---|
| | | | | Hourly (lb/hr) | Annual (ton/year) |
| APC-COMB-TKLD | APC-COMB-TKLD | Vapor Combustors Tank/Load Stream | Nitrogen Oxides | 2.07 | 9.07 |
| | | | Carbon Monoxide | 4.13 | 18.10 |
| | | | Particulate Matter | 0.04 | 0.19 |
| | | | Volatile Organic Compounds | 1.89 | 8.29 |
| | | | n-Hexane | 0.11 | 0.47 |
| | | | Benzene | <0.01 | 0.01 |
| | | | Toluene | 0.01 | 0.05 |
| | | | Ethylbenzene | 0.01 | 0.05 |
| | | | Xylenes | 0.04 | 0.16 |
| | | | Carbon Dioxide Equivalent | 1756.47 | 7693.34 |
| EP-PILOT | EU-PILOT | Vapor Combustor Pilot | Nitrogen Oxides | 0.01 | 0.02 |
| | | | Carbon Monoxide | 0.00 | 0.02 |
| | | | Particulate Matter | <0.01 | <0.01 |
| | | | Volatile Organic Compounds | <0.01 | <0.01 |
| | | | Sulfur Dioxide | <0.01 | <0.01 |
| | | | Carbon Dioxide Equivalent | 5.30 | 23.21 |
| EU-FUG | EP-FUG | Fugitive Emissions | Volatile Organic Compounds | 1.55 | 6.80 |
| | | | Total HAPs | 0.11 | 0.48 |
| | | | Carbon Dioxide Equivalent | 40.46 | 177.21 |

The following table represents the total facility emissions:

| Pollutant | Maximum Pre-Modification Annual Facility Wide Emissions (tons/year) | Maximum Post-Modification Annual Facility Wide Emissions (tons/year) | Net Facility Wide Emissions Changes (tons/year) |
|---|---|---|---|
| Nitrogen Oxides | 31.92 | 19.36 | -12.55 |
| Carbon Monoxide | 51.66 | 26.66 | -25.01 |
| Volatile Organic Compounds | 77.82 | 16.63 | -61.18 |
| Particulate Matter | 24.29 | 2.65 | -21.65 |
| Sulfur Dioxide | 0.07 | 0.06 | -0.01 |
| Formaldehyde | 0.23 | 0.01 | -0.22 |
| Benzene | 0.08 | 0.01 | -0.07 |
| Ethylbenzene | 0.44 | 0.08 | -0.36 |
| n-Hexane | 4.30 | 1.03 | -3.27 |
| Toluene | 0.47 | 0.09 | -0.38 |
| Xylenes | 1.41 | 0.27 | -1.14 |
| Total HAPs | 7.08 | 1.49 | -5.59 |
| Carbon Dioxide Equivalent | 28,272 | 18,668 | -9604 |

The following table indicates the control device efficiencies that are required for this facility:

| Emission Unit | Pollutant | Control Device | Control Efficiency |
|---|---|---|---|
| EU-TANKS-COND, EU-TANKS-PW Storage Tanks | Volatile Organic Compounds | Vapor Combustor | 98.00 % |
| | Total HAPs | | 98.00 % |
| EU-LOAD-COND, EU-LOAD-PW Loadout Racks | Volatile Organic Compounds | Vapor Return/ Combustion | 70.00 % |

## REGULATORY APPLICABILITY

In accordance with the proposed administrative updates, the applicability of rules and regulations to this facility have changed as follows:

**40CFR60 Subpart JJJJ** (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE))

> 40CFR60.4230 states that a source that commenced construction after June 12, 2006 whose SI ICE was less than 500 hp and was manufactured on or after July 1, 2008 is subject to this rule. SWN has proposed to remove one (1) 145-HP SI ICE and one (1) 215-HP SI ICE. Since no other SI ICE are on site that are subject to this rule, SWN is not subject to this rule. The section of the permit that pertains to this rule has been removed.

**40CFR63 Subpart ZZZZ** (National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines)

> Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.
>
> The facility is a minor source of hazardous air pollutants (HAPS < 10 tpy of an individual HAP and < 25 tpy of aggregate HAPs) as can be seen in Table 3. The facility is therefore considered an area source (§63.6585(c)).
>
> Stationary RICE subject to Regulations under 40 CFR Part 60 must meet the requirements of those subparts that apply (40 CFR 60 Subpart JJJJ, for spark ignition engines) if the engine is a new stationary RICE located at an area source (§63.6590(c)(1)). No additional requirements apply for this engine under this subpart.
>
> SWN has proposed to remove one (1) 145-HP SI ICE and one (1) 215-HP SI ICE. No other SI ICE are on site that are subject to this rule.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation. There will be a decrease in the already small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas with the removal of the natural gas-driven engine that is part of this administrative amendment.

## AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants).

## MONITORING OF OPERATIONS

Monitoring requirements in this permit are no longer applicable to EP-ENG1 Caterpillar G3306 NA engine and EP-ENG2 Caterpillar G3406 NA engine because they have been removed from the facility.

## CHANGES TO PERMIT R13-3093A

Emission Unit EP-ENG1 Caterpillar G3306 NA engine and EP-ENG2 Caterpillar G3406 NA were removed from section 1.0 Emission Units table. Permit sections applicable to the engine were also removed from the permit specifically Section 5.0, Section 9.1.6, and Section 10.

The design capacity of the vapor combustor was changed for 30-MMBtu/hr to15-MMBtu/hr in 1.0 Emission Units table.

The limitation on condensate in Section 8.1.4 was changed from 29,127,000 gallons/yr (29,127,000 gal/yr = 1900 bbl/day * 42 gal/bbl * 365 days/yr) to 1,226,400 gallons/yr (1,226,400 gal/yr = 80 bbl/day * 42 gal/bbl * 365 days/yr). Similarly, the limitation on produced water in Section 8.1.5 was changed from 29,127,000 gallons/yr to 3,066,000 gallons/year.

## RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates SWN's Robert Baxter Pad meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Wetzel County location should be granted a 45CSR13 Class I Administrative Update permit for their facility.

Jonathan Carney
Permit Writer

December 15, 2016
DATE